

# Progress of Measles Eradication in the United States

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**L**IVE ATTENUATED measles virus vaccine was licensed in the United States in 1963. Since then, its widespread use has dramatically reduced the incidence of measles. In 1967, just 4½ years after measles vaccine became available, cases declined to less than 13 percent of the average number reported before the vaccine was used. This summary describes the national status of measles cases and vaccine use through September 1967.

A Public Health Service report on the epidemiologic basis for the eradication of measles in 1967 (1) challenged organized medicine and public health to acknowledge the feasibility and rationale for prompt eradication of measles through systematic immunization.

On the basis of epidemiologic characteristics of the disease, the 1966 report identified four conditions essential for its eradication. These four conditions provided the framework for an intensive national effort of measles vaccination and surveillance in the United States.

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1. Routine immunization of infants at approximately 1 year of age.

2. Immunization of all susceptible children when they enter kindergarten, the first grades of elementary school, or other place of congregating. Childhood groupings are epidemiologically of major importance in spreading measles virus to household and community contacts.

3. Active surveillance of measles cases. Effective control depends on accurate knowledge of the incidence and epidemiologic characteristics of current cases.

4. Prompt control of measles epidemics. Even a single documented case of measles in an inadequately immunized area poses an epidemic threat that requires immediate action.

## 1967 Measles Eradication Effort

Challenged with the feasibility of measles eradication, governmental, professional, and health-related organizations were invited to collaborate actively in a national effort. Vaccination campaigns were developed on levels ranging from neighborhood to nation, from American Medical Association to parent-teachers' associations, from local health departments to Federal agencies with responsibilities for child and school health.

The emphasis on local responsibility resulted in a variety of formats. In some areas intensive mass campaigns provided vaccine for all susceptible infants and children not already im-

munized by private physicians, public health clinics, or other medical resources. In other areas, routine services of existing programs were extended to include measles vaccination for all susceptible children. In many parts of the country where outbreaks of measles occurred, epidemic control programs were developed. In some localities, these control programs evolved into communitywide measles eradication efforts.

Financial resources for the campaigns varied, with funds and services provided by Federal and State Governments, local medical and health organizations, and donations from participants. About 60 percent of the 7 to 8 million doses of measles vaccine estimated to have been used during 1967 were purchased through Federal project grants, which are administered by the National Communicable Disease Center and serve 92 percent of the nation's population.

#### **Achievements Through September 1967**

The chart shows the decline in the number of measles cases and the relationship of the number of cases to vaccine use since 1963. Reported measles cases in recent years are compared with an average derived from data recorded in the 5 years immediately preceding the use of measles vaccine. An average of approximately 495,000 cases of illness were reported annually in 1958-62; the range was 406,000 to 763,000 cases.

The decline in reported cases began in 1965 and has been most pronounced in 1967. During the first 9 months of 1967, only a third as many measles cases were reported as in the comparable period of 1966. The total for the first 9 months of 1967 represented less than 13 percent of the average for a comparable period in the last 5 prevaccine years. The chart data extend through September 1967—reports ending at a time of characteristically low seasonal occurrence of measles. Approximately 200 cases were reported each week in September 1967 compared to a weekly number of about 1,000 cases during an average September before measles vaccine was used.

Measles case reports are related also to the cumulative net annual distribution of live measles virus vaccine (see chart). Although the number of doses of vaccine distributed should not be construed as the exact count of persons

vaccinated, it does provide a valuable working estimate of vaccine use. From 1963, when the vaccine was licensed, to the end of 1967, approximately 28 million doses were distributed in the United States. A direct relationship between the increase in the level of immunity achieved through vaccination and the decline in measles cases is suggested.

#### **Comment**

On a national basis, we can expect rapid disappearance of the characteristic phenomenon of widespread epidemic measles. In States where vaccination programs are reaching a substantial portion of susceptibles, measles has been or will be reduced to an occasional case or a cluster of a few cases. In States where immunization activities have been less satisfactory, measles will persist until adequate levels of immunity are reached. Until then, these States will continue to serve as a reservoir for measles virus.

There were an estimated 10 million measles-susceptible infants and children in the United States at the beginning of 1967. During the first three-quarters of the year approximately 5 million doses of measles vaccine were administered, and an estimated 400,000-500,000 measles cases occurred. In this same interval, between 2 and 3 million infants reached their first birthday, the age at which vaccination against measles is recommended. Therefore, in September 1967, about 7 to 8 million infants and children remained susceptible to measles.

Successful campaigns in 1967 have contributed greatly to eradication of measles in the United States. Five specific achievements are particularly characteristic of areas in which comprehensive measles programs were established.

1. *Improved efficiency in measles case reporting.* Now that the incidence of measles is falling rapidly and interest in the disease is rising, a greater proportion of cases will probably be reported. How much increase in measles reporting will occur cannot be predicted. Its influence can be expected, however, to retard temporarily the apparent decline in cases until those reported and those actually occurring become more nearly synonymous.

2. *Occurrence of measles at levels less than 5 percent of the average before measles vaccine.*

Although improved reporting efficiency may modify the decline, case reports of less than 5 percent of the premeasles vaccine average should be evident in 1968 in well-immunized populations. In areas with continuing, intensive measles programs, the number of measles cases can be expected to decline further in the coming months, to less than 1 percent of the premeasles vaccine average.

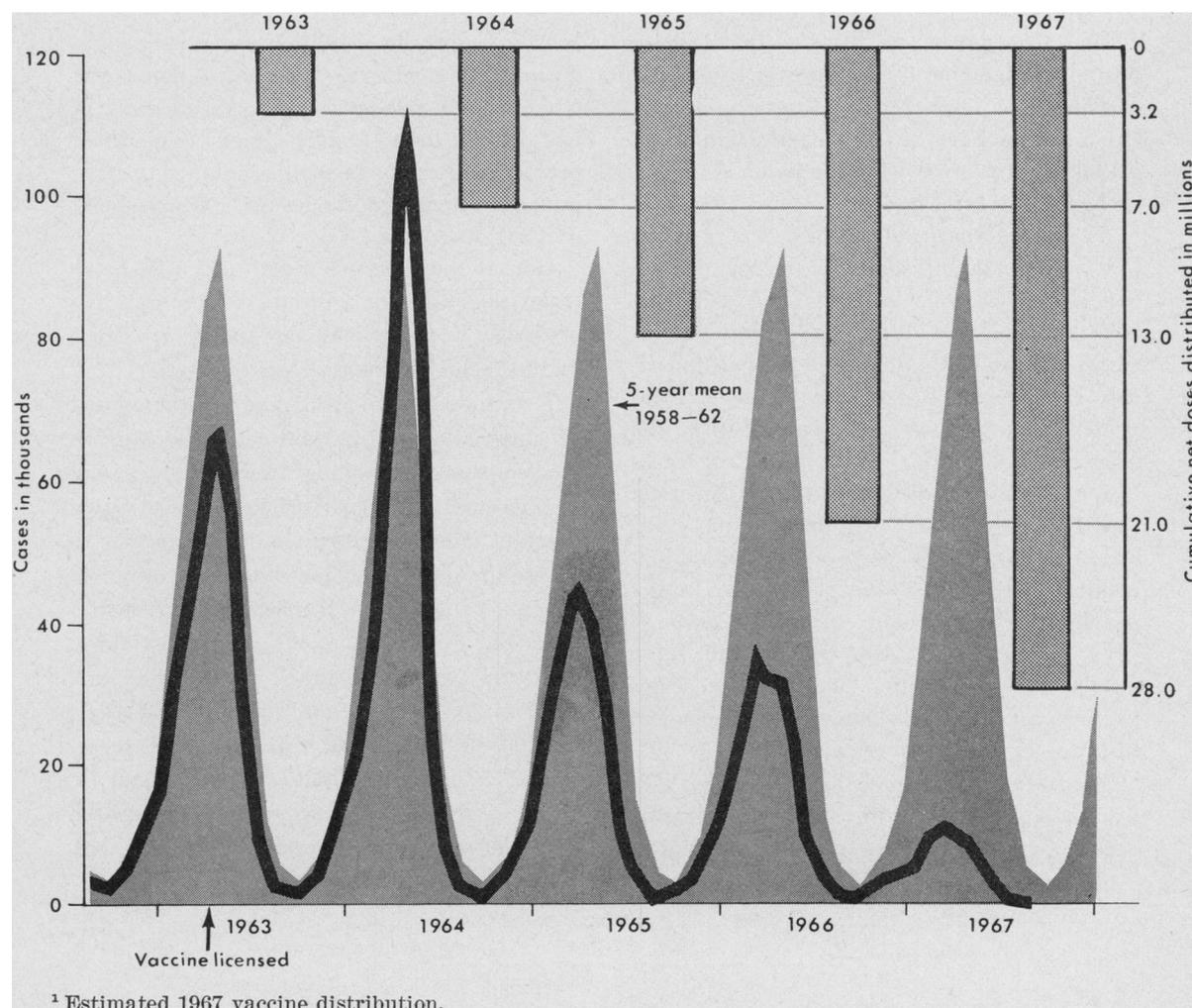
3. *Surveillance of individual measles cases.* Eventually, the only meaningful way to evaluate adequate control of measles will be through a careful documentation of all suspected cases and a search for correct diagnosis in unexplained childhood exanthems. The measles cases

identified in an area with a high level of vaccination often reveal an importation of the infection.

4. *Epidemic control readiness.* Even one documented case of measles requires the immediate evaluation of immunity in the affected group or neighborhood and prompt vaccination of all identified susceptibles.

5. *Ongoing community measles programs.* Measles vaccination and surveillance activities have become routine parts of community preventive medical practice in which persons responsible for medical, public health, and school health activities acknowledge their roles in insuring continuing freedom from measles.

**Measles cases by 4-week periods, 1963–67, compared with 1958–62 mean and cumulative annual vaccine doses,<sup>1</sup> United States**



## Summary

Widespread use of effective measles vaccines has resulted in a dramatic decline of reported measles cases. During the first 9 months of 1967, cases were recorded at less than 13 percent of the average level reported in years before measles vaccine was used. We estimate, from data on distribution of vaccine, that some 28 million doses were used by the end of 1967. The final appraisal of the 1967 national measles eradication effort can only be carried out in 1968. Data from areas where effective programs have been established show that the occurrence

of measles in comparably immunized populations can be expected to decline to levels less than 5 percent of that experienced before the use of measles vaccine. The complete eradication of measles will be achieved when vaccination and surveillance activities have become a routine part of health care throughout the country.

## REFERENCE

- (1) Sencer, D. J., Dull, H. B., and Langmuir, A. D.: Epidemiologic basis for eradication of measles in 1967. *Public Health Rep* 82: 253-256, March 1967.

## Regional Medical Library for South America

The government of Brazil, the Paulista School of Medicine of the Federal University of São Paulo, and the Pan American Health Organization have agreed to establish a regional library of medicine for South America, to be located at Paulista.

As an international agency, the new library will be administered by the Pan American Health Organization, in close affiliation with the school and in cooperation with the National Library of Medicine and the Pan American Federation of Associations of Medical Schools. The primary goals are to further the progress of biomedical research and the teaching and practice of medicine in South America. The regional library will provide increased access to a comprehensive collection of biomedical publications and will make bibliographic materials more accessible through MEDLARS demand searches. It will serve also as a demonstration and training center to encourage the development of biomedical libraries in South America.

The library will provide health professionals in Latin America with medical literature services, primarily through the existing li-

braries in schools of medicine, dentistry, public health, veterinary medicine, nursing, and other schools and institutions. Additionally, it will provide these services directly to qualified persons. This arrangement is designed to stimulate participating libraries in the development of their resources.

One of the library's main tasks will be to make potential users aware of the services available, to disseminate news of its activities, and to relate the results of its services.

A technical advisory committee, composed of internationally recognized authorities in medical librarianship and health sciences, will be selected by the Pan American Health Organization. The committee will meet annually to advise the director of the library on technical aspects of policy, programing, administration, and evaluation of the library activities. Both the National Library of Medicine and the Pan American Federation of Associations of Medical Schools will have permanent representatives on the committee. The National Library will also provide training in search formulation and programing at Bethesda, Md.